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Building & Highway Material Testing Laboratory

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/RS/W.No.14/BC/Stability/2017-18 07.06.2017

TEST REPORT ON MARSHALL STABILITY OF MIX

*** Customer**	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
***Name of the Work**	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
***Reference**	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
*** Source**	:	Hot mix Plant, Bangalore
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	07.06.2017

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability, Kn	9.15	9.60	9 Kn (min)
2	Marshall flow, mm	2.50	2.65	2 – 4
3	Percent air voids in Mineral Aggregate	3.10	3.95	3 – 6
4	Voids in Compacted Mix	13.25	14.10	13 - 15
5	Percent Voids filled with Bitumen	67.25	68.30	65 - 75
6	Density, g/cc	2.27	2.28	--

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/RS/W.No.14/GSB-I/GR/2017-18 Date 15.05.2017

TEST REPORT ON GRADATION FOR COARSE GRADED GARNULAR SUB BASE

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	Coarse Graded-I
Technical Reference	:	IS : 2720 (Part - 4) 1985 (RA-2010), MORTH Table : 400-2
Date of Testing	:	15.05.2017

Oven Dry Wt (gm) : 5000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specified Limits
75	0	0	0	100	100
26.5	1420	1420	28.40	71.60	55-75
4.75	2420	3840	76.80	23.20	10-30
0.075	985	4825	96.50	3.50	<10
PAN	175				
Total	5000				

* Information is furnished by the Customer/Representative

Remarks: Satisfies MORTH Specifications as per Table 400-2, Grading I

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Job No.: CTCE/BBMP/RS/W.No.14/GSB-1/AL/2017-18

Date 15.05.2017

TEST REPORT ON ATTERBERG LIMITS FOR GRANULAR SUB BASE

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	GSB- (Coarse graded-I)
Technical Reference	:	IS : 2720 (Part - 5) 1985 (RA-2010), MORTH Table : 400-01
Date of Testing	:	15.05.2017

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	22.50	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/Gradation/2017-18 22.05.201

TEST REPORT ON GRADATION OF WET MIX MACADAM

*** Customer**	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
*** Name of Work**	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunt in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
*** Reference**	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	22.05.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Mort Table 400-1
53	0	0	0	100	100
45	90	90	1.8	98.2	95-100
22.4	1450	1540	30.80	69.20	60-80
11.2	1160	2700	54.00	46.00	40-60
4.75	490	3190	63.80	36.20	25-40
2.36	500	3690	73.80	26.20	15-30
0.600	435	4125	82.50	17.50	8-22
0.075	605	4730	94.60	5.40	0-8

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/Gradation/2017-18 22.05.

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of Work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagu in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	22.05.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Lim As per Mo Table 400
53	0	0	0	100	100
45	110	110	2.2	97.8	95-100
22.4	1460	1570	31.40	68.60	60-80
11.2	1210	2780	55.60	44.40	40-60
4.75	480	3260	65.20	34.80	25-40
2.36	515	3775	75.50	24.50	15-30
0.600	480	4255	85.10	14.90	8-22
0.075	595	4850	97.00	3.00	0-8

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/AIV/2017-18 22.05.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of Work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS : 2386(Part -4)-1963 (RA-2011)
Date of Testing	:	22.05.2017

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	393	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	305	307	
4	Aggregate Impact value = percent fines 100* (W2/W1)%	21.59	21.88	21.74

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/AIV/2017-18 22.05.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATE

*** Customer**	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
*** Name of Work**	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
*** Reference**	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
*** Sample ID**	:	Wet Mix Macadam
Technical Reference	:	IS : 2386(Part -4)-1963 (RA-2011)
Date of Testing	:	22.05.2017

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	304	
4	Aggregate Impact value = percent fines 100* (W2/W1)%	21.32	21.24	21.28

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/Shape.T/2017-18 22.05.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of Work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386(Part 1) 1963 (RA 2011)
Date of Testing	:	22.05.2017

Sl.No.	Description	Result
1	Flakiness Index	11.96%
2	Elongation Index	13.25%
3	Combined Flakiness & Elongation Index	25.21%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/RS/W.No.14/WMM/Shape.T/2017-18 22.05.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

*** Customer**	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
*** Name of Work**	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
*** Reference**	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
*** Sample ID**	:	Wet Mix Macadam
Technical Reference	:	IS 2386(Part 1) 1963 (RA 2011)
Date of Testing	:	22.05.2017

Sl.No.	Description	Result
1	Flakiness Index	12.35%
2	Elongation Index	13.90%
3	Combined Flakiness & Elongation Index	26.25%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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T-2377

Job No.: CTCE/BBMP/RS/W.No.14/CSR-06/354a/QB(BC)/2017-18 05.06.2017

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*** Customer**	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
*** Name of work**	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
*** PMC Reference**	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
*** Sample ID**	:	Bitumen
Source/ Location	:	Hot Mix Plant, Bangalore.
Sample Received on	:	05.06.2017
Period of Testing	:	05.06.2017

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The results of the tests conducted on the bitumen sample are as follows:

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2014)	62	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2014)	46	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2014)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2014)	296	Min. 220

* Information is furnished by the Customer/Representative

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Technical Manager

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Job No.: CTCE/BBMP/RS/W.No.14/BC/AIV/2017-18 05.06.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of Work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	Hot mix plant, Bangalore.
* Type of Mix	:	Bituminous Concrete
Technical Reference	:	IS: 2386 (Part- 4)-1963 (RA-2011)
Date of Testing	:	05.06.2017

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	298	302	
4	Aggregate Impact value = percent fines 100* (W2/W1) percent	21.58	21.76	21.67

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/RS/W.No.14/BC/Agg/2017-18 07.06.2017

TEST REPORT ON GRADATION OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Shivarama,** No.4/13, 1st Cross, Avalamma Choutry, Magadi Road, Bangalore – 560 023.
* Name of Work	:	Improvements to roads and drains at Havanoor Layout in Bagalagunte in Bagalagunte in Ward No.14, in Dasarahalli Sub Division, BBMP, Bangalore.
* Reference	:	EE/DD/WO/58/2017-18 Dated: 03.05.2017
* Sample ID	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Hot mix plant, Bangalore
Date of Testing	:	07.06.2017

Total Weight of Sample: **5150** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	725	14.08	14.08	85.92	79 - 100	
9.5	560	10.87	24.95	75.05	70 - 88	
4.75	640	12.43	37.38	62.62	53 - 71	
2.36	585	11.36	48.74	51.26	42 - 58	
1.18	535	10.39	59.13	40.87	34 - 48	
0.600	525	10.19	69.32	30.68	26 - 38	
0.300	575	11.17	80.49	19.51	18 - 28	
0.150	330	6.41	86.89	13.11	12 - 20	
0.075	340	6.60	93.50	6.50	4 - 10	

Total Weight of Sample: **5300** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	610	11.51	11.51	88.49	79 - 100	
9.5	630	11.89	23.40	76.60	70 - 88	
4.75	620	11.70	35.09	64.91	53 - 71	
2.36	580	10.94	46.04	53.96	42 - 58	
1.18	610	11.51	57.55	42.45	34 - 48	
0.600	560	10.57	68.11	31.89	26 - 38	
0.300	525	9.91	78.02	21.98	18 - 28	
0.150	375	7.08	85.09	14.91	12 - 20	
0.075	445	8.40	93.49	6.51	4 - 10	

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